Mechanical Properties of Mengkuang Leave Fiber Reinforced Low Density Polyethylene Composites

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Abstract:
Mengkuang (Pandanus tectorius) grows abundantly in the coastal region of Southeast Asia. To date, the application of mengkuang leaves fiber (MLF) as reinforcement in polymer matrix is still limited in literature making its potential as reinforced material remain unknown. Therefore, this chapter focuses on the tensile properties, flexural, and impact properties of (MLF)/LDPE composite fabricated through the hot compression machine. In this study, the effect of volume fraction, fiber length of MLF was investigated. Two main groups of MLF/LDPE composite samples were established. The first group consists of different fiber mesh size range (<0.5 mm, 0.5–8 mm, and 1–2 mm) with constant volume fraction (10 wt%) while in another group volume fraction is varying (10, 20, and 30 wt%) but constant fiber length (<0.5 mm). Further investigation was conducted by treating the MLF/LDPE composite of volume fraction 30 wt% and fiber length 0.5 mm with maleic anhydride polyethylene (MAPE) with loading content of 2, 4, and 6 wt% The surface fracture of each samples was analyzed via scanning electron microscope. The result from both groups is compared to the pure LDPE. From the result, it can be concluded that both volume fraction and fiber length do not improve tensile properties and impact properties of MLF/LDPE composite. However, the flexural strength of MLF/LDPE increased significantly. A similar result was obtained when MLF/LDPE composite was treated with the MAPE.

Keywords: Mengkuang; MAPE; Mechanical properties; LDPE; Maleic anhydride polyethylene

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